

REMARKS

The present Amendment amends claims 1-24 and leaves claims 25-35 unchanged. Therefore, the present application has pending claims 1-35.

In paragraph 1 of the Office Action the Examiner objected to claims 15-17 under 37 CFR §1.75(c) as being in improper form being that the Examiner alleges that these claims do not refer to the other claims in the alternative. Amendments were made to claims 15-17 to clarify that the claims refer to the other claims in the alternative. Therefore, this objection is overcome and should be withdrawn.

Claims 1, 2, 4-7, 9, 11, 15, 18-21, 23-25, 27-29 and 32-35 stand rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regards as the invention. Various amendments were made throughout claims 1, 2, 4-7, 9, 11, 15, 18-21, 23-25, 27-29 and 32-35 so as to bring them into conformity with the requirements of 35 USC §112, second paragraph. Therefore, Applicants submit that this rejection is overcome and should be withdrawn.

Specifically, amendments were made throughout claims 1, 2, 4-7, 9, 11, 15, 18-21, 23-25, 27-29 and 32-35 so as to overcome the objections noted by the Examiner in paragraph 2 of the Office Action.

The Examiner's cooperation is respectfully requested to contact Applicants' Attorney by telephone should any further indefinite matters be discovered so that appropriate amendments may be made.

Claims 1-9 and 18-35 stand rejected under 35 USC §102(e) as being anticipated by Rantala (U.S. Patent No. 5,680,570); claims 10, 11, 13 and 14 stand

rejected under 35 USC §103(a) as being unpatentable over Rantala in view of Tamura (U.S. Patent No. 5,640,556); and claim 12 stands rejected under 35 USC §103(a) as being unpatentable over Rantala and Tamura in view of Lin (U.S. Patent No. 5,386,578). These rejections are traversed for the following reasons. Applicants submit that the features of the present invention as recited in the claims are not taught or suggested by Rantala, Tamura or Lin whether taken individually or in combination with each other as suggested by the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw these rejections.

Amendments were made to the claims so as to more clearly recite that the present invention is directed to an extensible network-attached secondary storage for use in a system including a plurality of computers, at least one secondary storage apparatus and a network or I/O cable for connecting the computers with the secondary storage apparatus.

Prior to Applicants invention, conventionally what is known as a network-attached storage (NAS) secondary storage implements a "block-based I/O function". Thus, prior to Applicants invention it was common knowledge among those skilled in the art that a NAS secondary storage could not implement an "object-based I/O function".

The present invention as now more clearly recited in the claims overcomes the above noted disadvantages of the conventional apparatus by providing a NAS secondary storage that is capable of performing an "object-based I/O function". The amended claims specifically recite such novel configuration according to the features noted as follows:

(1) A first computer in a system including the NAS secondary storage, executes at least one a plurality of application programs, in which the first computer works in conjunction with said secondary storage apparatus.

(2) The secondary storage apparatus stores at least one application data used by the application programs, and the secondary storage apparatus provides the first computer with the block-based I/O function and the object-based I/O function.

(3) For realizing the object-based I/O function, the secondary storage apparatus receives from the computers an object access module that when executed implements the object-based I/O function by using the block-based I/O function. Thus, the secondary storage apparatus has the function of searching for the appropriate object access module for a particular computer.

(4) The secondary storage apparatus further receives object-based I/O request for application data from the first computer and performs object-based I/O of the object-based I/O request by executing the object access module.

The above described features of the present invention now more clearly recited in the claims are not taught or suggested by any of the references of record namely Rantala, Tamura and Lin whether taken individually or in combination with each other as suggested by the Examiner.

Rantala discloses a memory system having a dynamically allocatable non-volatile storage capability. In Rantala, the volatile storage uses DRAM storage, while the non-volatile storage uses SRAM storage. According to Rantala, in the combination of the DRAM storage and the SRAM storage, the DRAM stores all of the data blocks, while the SRAM stores only the data required to be safely stored,

said data being a subset of the data stored in the DRAM. Rantala teaches that a mapping logic is used for managing use of the SRAM. Attention is directed to the Abstract of Rantala. Thus, Rantala merely discloses a memory system per se.

In contrast, the features of the present invention as now more clearly recited in the claims are directed to a NAS secondary storage apparatus which implements an object-based I/O function using the block-based I/O function. Such features are clearly not taught or suggested by Rantala.

Thus, the features of the present invention as now more clearly recited in the claims, particularly claims 1-9 and 18-35 are not taught or suggested by Rantala whether taken individually or in combination with any of the other references of record. Therefore, reconsideration and withdrawal of the 35 USC §102(e) rejection of claims 1-9 and 18-35 as being anticipated by Rantala is respectfully requested.

The above noted deficiencies of Rantala are not supplied by any of the other references of record particularly Tamura and Lin. Therefore, combining the teachings of Rantala with one or more of Tamura and Lin still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Tamura is merely relied upon by the Examiner for an alleged teaching of object description data for specifying the file format of the object based on whether the data stored in a specific part of one or more blocks contain some specific value or pattern. However, this teaching of Tamura does not supply any of the above noted deficiencies of Rantala particularly with regard to the providing of a NAS secondary storage apparatus which implements an object-based I/O function using

the block-based I/O function as recited in the claims. Thus, combining the teachings of Rantala and Tamura in the manner suggested by the Examiner in the Office Action still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Therefore, reconsideration and withdrawal of the 35 USC §103(a) rejection of claims 10, 11, 13 and 14 as being unpatentable over Rantala in view of Tamura is respectfully requested.

The above noted deficiencies of both Rantala and Tamura are also not supplied by Lin. Therefore, combining the teachings of Rantala, Tamura and Lin in the manner suggested by the Examiner in the Office Action still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Lin is merely relied upon by the Examiner for an alleged that the object description data is data for specifying the data sequence or inter-block reference of data in a block based on the offset and size thereof. However, at no point is there any teaching or suggestion in Lin of the above described features of the present invention now more clearly recited in the claims wherein a NAS secondary storage is provided that implements an object-based I/O function using the block-based I/O function. Thus, combining the teachings of Rantala, Tamura and Lin in the manner suggested by the Examiner in the Office Action still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Therefore, reconsideration and withdrawal of the 35 USC §103(a) rejection of claim 12 as being unpatentable over Rantala, Tamura and Lin is respectfully requested.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references utilized in the rejection of claims 1-35.

In view of the foregoing amendments and remarks, Applicants submit that claims 1-35 are in condition for allowance. Accordingly, early allowance of claims 1-35 is respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (520.37728X00).

Respectfully submitted,

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